

Nutrition Risk of Older Persons Participating in Home-Delivered and Congregate Meal Programs in Relationship to Demographics and Community Resources

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Abstract

Identifying problems that potentially compromise the nutritional status of the elderly can aid in decreasing the risk of disease and improving overall health. Several nutrition risk factors associated with health and well-being have been described by the national Nutrition Screening Initiative (NSI) and encapsulated in the Determine Your Nutritional Health (DETERMINE) Checklist. Working with the 16 planning and service areas in Indiana, we conducted a survey of all participants in congregate and home-delivered meal programs, using the NSI DETERMINE Checklist and questions about demographics and housing and living arrangements. The purpose of the initial project was to characterize the extent of potential nutrition risk among the senior citizen meal participants. Following the NSI's guidelines, meal participants were categorized as being at low, medium, or high nutrition risk potential. The percentage of those at high nutrition risk potential was computed for each county. US Census data for population demographics and community resources were used in the analysis. The maps resulting from analysis show locations of potential nutrition risks as determined by the survey data and their interaction with US Census data and other existing data. One practical application of geographic information systems in this project was the ability to strategically locate needed services for community-dwelling older Americans, who represent a composite of several ethnic groups and other groups that may have special and unique needs. Other outcomes of the project included direct impact on services provided to older persons, increased visibility of nutrition needs of older people (evidenced by media coverage), and heightened awareness by professionals regarding nutrition needs of older people.

Keywords: Nutrition Screening Initiative (NSI), DETERMINE, congregate meals, homebound, geriatric nutrition

Introduction and Purpose

Identifying problems that potentially compromise the nutritional status of the elderly can aid in decreasing their risk of disease and improving their overall health. One-third to one-half of elders' health problems are thought to be related to inadequate nutrient intake (1). Numerous factors associated with the older population can contribute to inadequate intake. Some of these include education (2,3), loneliness (4), bereavement (5), and being homebound (6,7).

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Several nutrition risk factors associated with health and well-being have been described by the national Nutrition Screening Initiative (NSI) and encapsulated in the Determine Your Nutritional Health Checklist (a.k.a. DETERMINE) (8).

The purpose of the initial project was to characterize the extent of potential nutrition risk among the senior citizen meal program participants in Indiana and to provide education to these meal participants regarding nutrition and health. As the project unfolded, the decision was made to analyze the Indiana data using geographic information systems (GIS) because of the impact the visual map presentations would have, and because of the great potential for interfacing the nutrition survey data with US Census data and other existing data.

Materials and Methods

Data Collection and Methods of Analysis

The nutrition program coordinator of the Indiana Division on Aging and InHome Services, in conjunction with the author, a faculty member at Ball State University, conducted a survey of all participants in congregate and home-delivered meal programs in Indiana's 16 planning and service areas (PSAs). This survey used the NSI DETERMINE Checklist and a list of questions about demographics, housing and living arrangements, attitudes toward the meals provided, and zip code information. Registered dietitians, cooperative extension specialists, meal site managers, and meal delivery employees helped participants complete the surveys. Over 12,000 surveys were returned and coded for federal information processing standards (FIPS) for county data, then analyzed at Ball State University using SPSS-X (SPSS Inc, Chicago, IL) for preliminary statistical results and MGE (Intergraph Corporation, Huntsville, AL), Microsoft Excel, and Informix Online Database Engine (Informix Software, Inc, Menlo Park, CA). Excel was used to summarize data for each of the 92 counties; these data were then related to census and other data. Each county was treated as a record. Note should be made that, although use of the DETERMINE Checklist was not required at the time of this project, the National Aging Program Information System (NAPIS) (administered by the US Department of Health and Human Services' Administration on Aging) now requires that the Checklist be used to determine which clients receiving services of home-delivered meals, senior congregate meals, nutrition counseling, and case management are at high nutritional risk.

Following the NSI's guidelines, meal participants were categorized as being at low, medium, or high nutrition risk potential. The percentage of those at high nutrition risk potential was computed for each county. The 92 counties were divided into quartiles, based on the percentage of those at high nutrition risk potential. GIS was selected as the tool for analysis because it can point to geographic areas of concern, allow users to look at those areas within the context of the counties and the PSAs in which they exist, and interrelate the nutrition risk data with other demographic, health, and community resource data.

Use of Existing Data

1990 US Census data for population demographics, sampled US census data (taken from the US Census Bureau's "USA Counties 1994" CD-ROM) for health resource

information, and community meal site directory information were analyzed to characterize (at the individual-county level) the socioeconomic environment and selected resources that would potentially impact the overall well-being of the study participants. Examples of existing data categories used in the analysis include age distribution of older people, minority populations, poverty levels of older people, dependency ratios (65+/19–64 years of age), and physician and hospital availability within the counties. For each county, the number of senior meal sites was related to the number of older people within the county.

Consideration of Other Resources Available

In pursuing GIS analysis, already available campus resources at Ball State University (Muncie, IN) associated with GIS were sought and utilized. Computers and software were available, as well as faculty and staff knowledgeable about GIS. Especially critical to the success of this project was the University's Computing Services Graphics Systems Administrator. This individual has a landscape architecture background and has provided extensive knowledge to the technical aspect of using GIS; he also provided instruction and assistance as progress was made through the stages of this project.

Results

The results were summarized for the entire state and for each of the 16 PSAs, each of which included two to nine counties (Figure 1). Within the entire state, the study

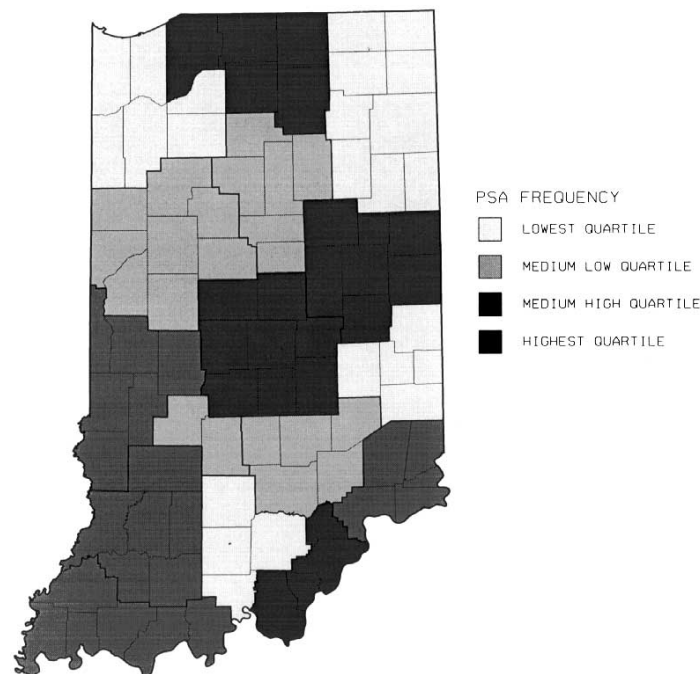


Figure 1 Distribution of high nutrition risk potential among meal program participants in Indiana's planning and service areas, 1993.

revealed that 34% of the 12,062 study participants were considered to be at high nutrition risk potential, based on the DETERMINE Checklist. Of the homebound, 52% were at high nutrition risk potential; 24% of the congregate meal group were at high risk potential. Composition of the study participants included 70% females; average age was 78, with a range from 60 to 106 years of age; 85% of the study participants were white; 8% were African-American.

The maps resulting from analysis showed in-depth geographic locations of potential nutrition risk, possible interactiveness with other data such as census demographics, meal site ratios, and possible relationships and patterns among contiguous or proximate counties. Figures 2 through 4 illustrate distribution of high nutrition risk for all participants (Figure 2), homebound meal participants only (Figure 3), and congregate meal participants only (Figure 4). Counties within a PSA vary in risk potential. Metropolitan counties tend to be in the highest or medium-high risk quartile. However, attention needs to be given also to the numerous non-metropolitan counties with high nutrition risk. The congregate program distributes services in a centralized community setting, and older people may need transportation to the site. Homebound older people need to have services delivered to the home, and lengthy travel through a remotely populated county to deliver a meal becomes a challenge to limited resources.

Figures 5 through 7 illustrate pertinent demographic distribution based on census data. In Figure 5, which represents proportions of old-old (75+ years of age)¹ residents,

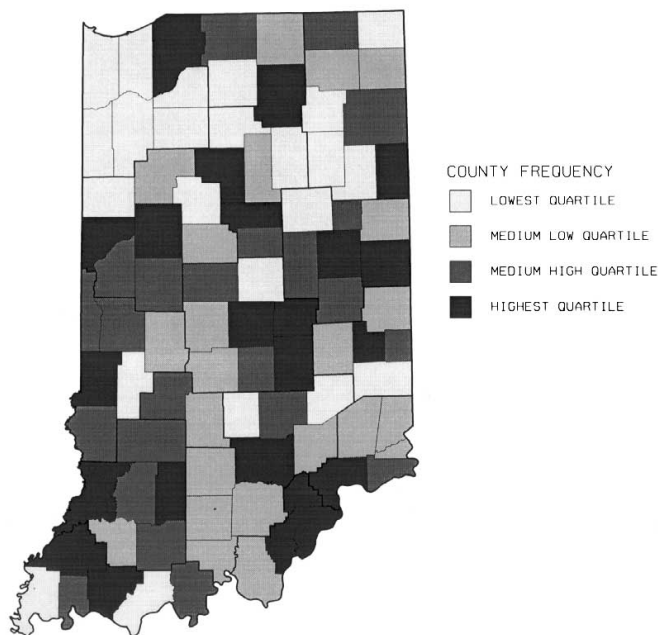


Figure 2 Distribution of high nutrition risk potential among all meal program participants, Indiana, 1993.

¹ "Old-old" is a term often used in the gerontology literature. (Generally, "young-old" describes people 60–75 or 65–75.) The old-old category reflects the probable increase in frailty and decline in functional status experienced in people over 75.

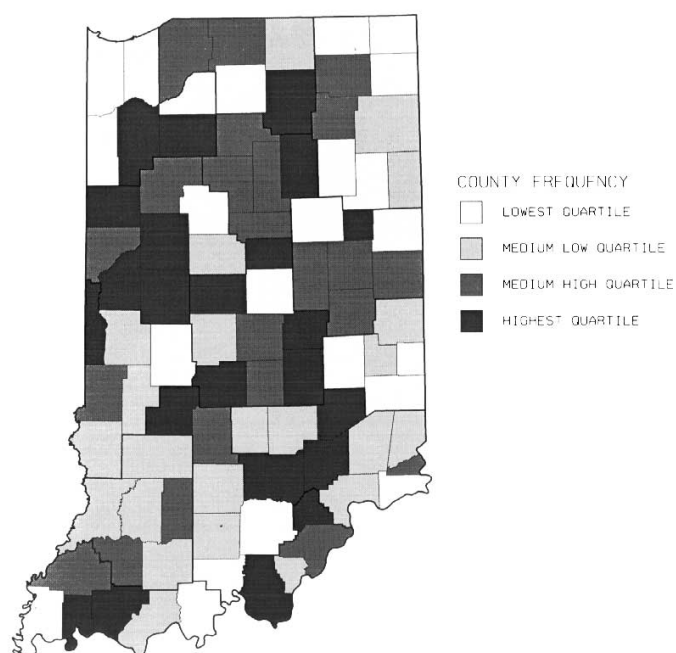


Figure 3 Distribution of high nutrition risk potential among homebound meal program participants, Indiana, 1993.

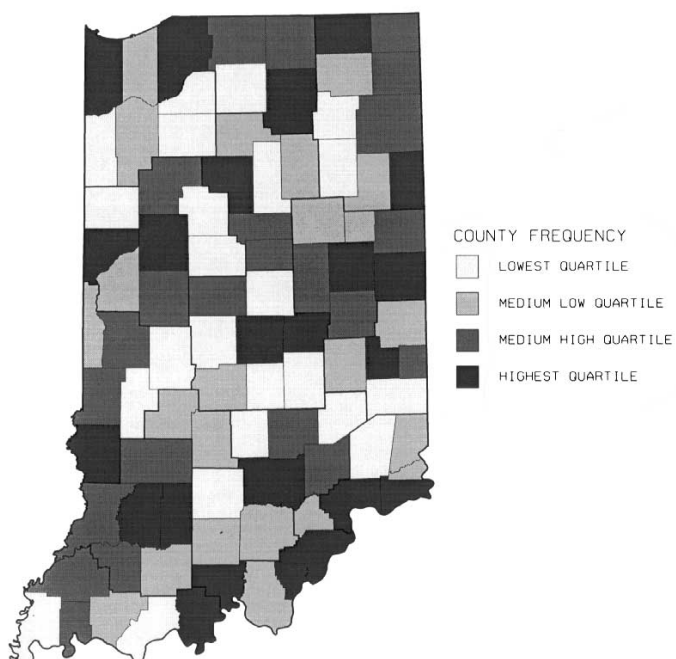


Figure 4 Distribution of high nutrition risk potential among congregate meal program participants, Indiana, 1993.

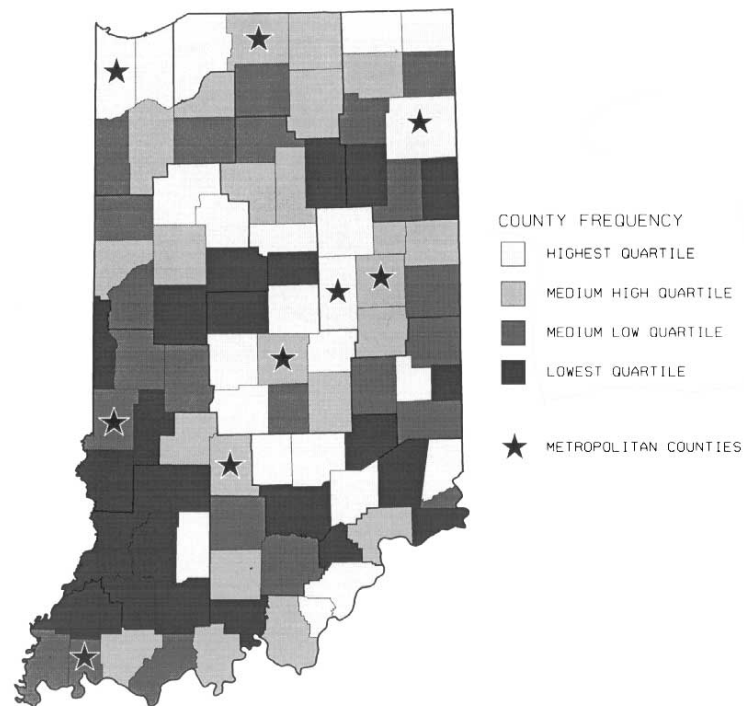


Figure 5 Quartile distribution of counties' old-old (75+) population, Indiana, 1993.

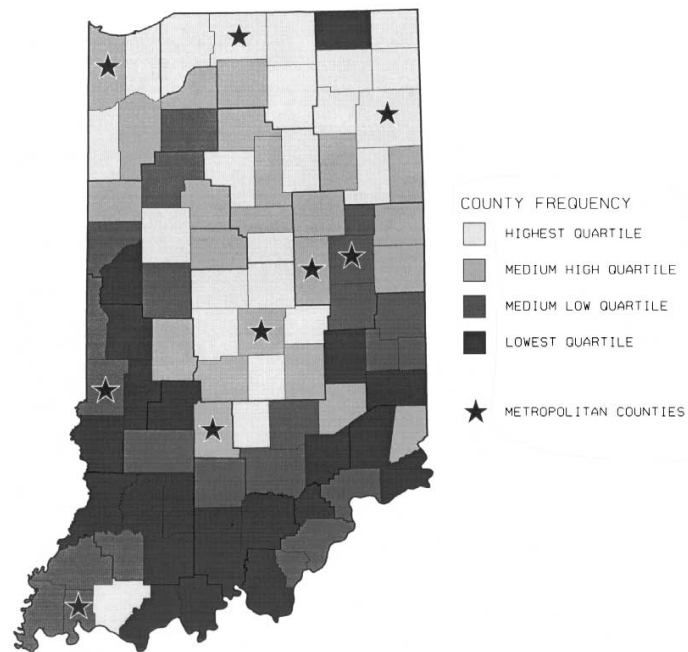


Figure 6 Distribution of counties' older population at or below poverty, Indiana, 1993.

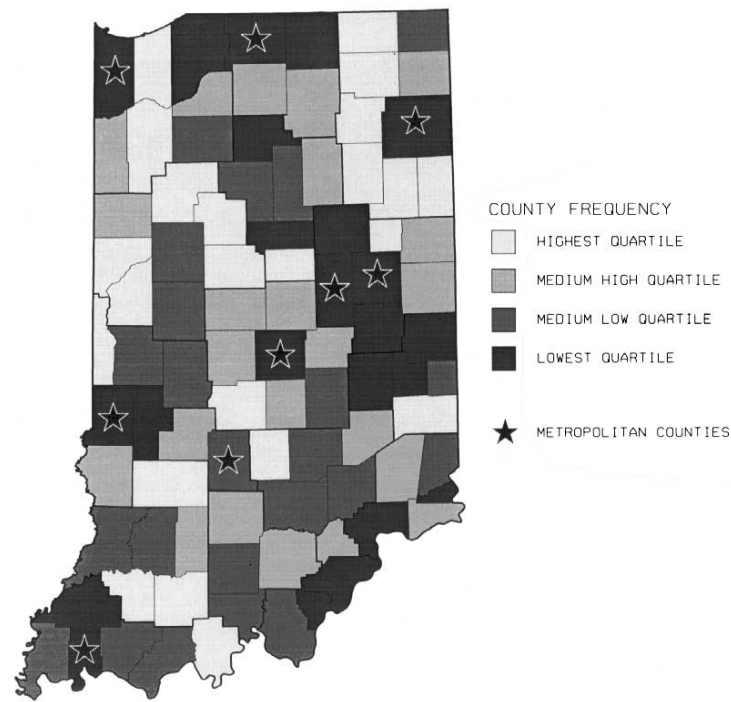


Figure 7 Distribution of counties' older African-American population, Indiana, 1993.

counties in the western and southern parts of the state have the highest proportions of those who are old-old. The metropolitan counties (starred) have a lesser proportion of old-old residents. Analysis of poverty among older persons (Figure 6) reveals that distribution of percentages of older persons at or below poverty income levels is similar to distributions of percentages of old-old residents; that is, the western and southern parts of the state have the highest percentages of older people at or below poverty income levels. Census data also provided information on locations of high percentages of various minority groups. Metropolitan counties have the highest distribution of older African-Americans (Figure 7).

Figure 8 represents the distribution of the dependency ratio (65+ / 19–64 year olds) and has many implications. We need to think about who is or will be taking care of older people. This can be considered at the family level as well as the service level. When we consider the demographics of aging, this ratio also has great potential in examining future trends.

The map in Figure 9 represents an index of the number of senior citizen meal sites per 1,000 older persons within each county. It is possible to identify counties that are in the highest quartile for the proportion of old-old population, but have a low number of meal sites in relation to the number of older persons. Figure 10 shows counties with the lowest meal site index and highest nutrition risk, along with counties with the highest meal site index and lowest nutrition risk. GIS can be used to identify uneven distribution of risk and allocated resources within each PSA.

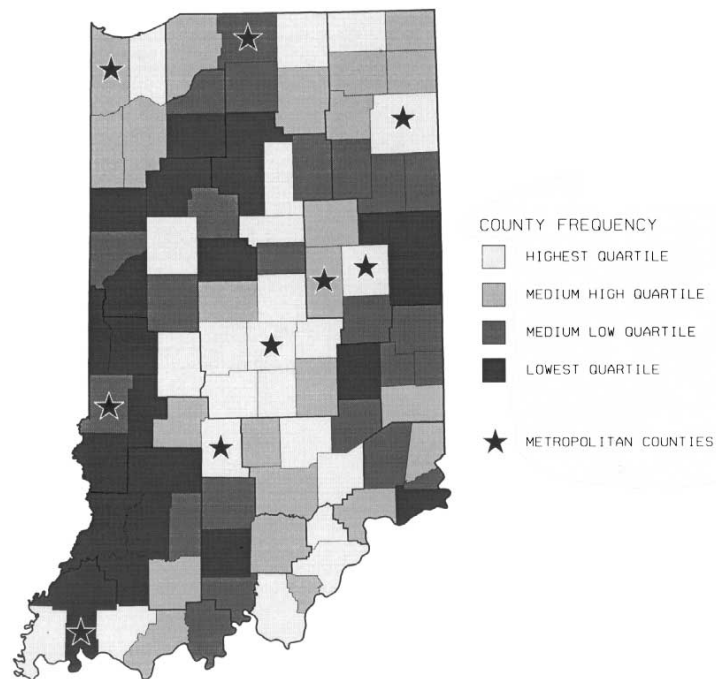


Figure 8 Distribution of counties' dependency ratio (65+/19-64), Indiana, 1993.

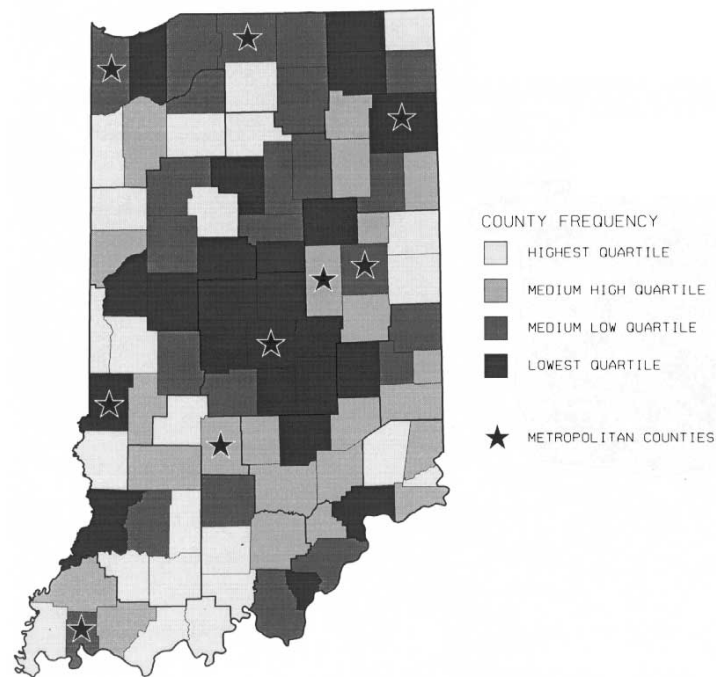


Figure 9 Distribution of meal sites per 1,000 older persons, Indiana, 1993.

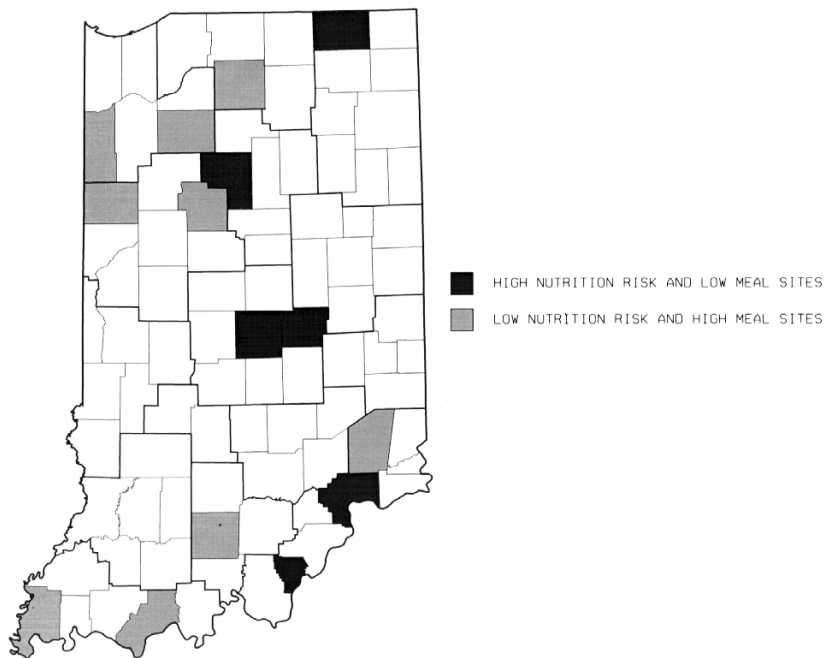


Figure 10 Example of GIS analysis revealing spatial relationship between counties with high nutrition risk/low meal sites and with low nutrition risk/high meal sites, Indiana, 1993.

Discussion and Conclusions

The limitations of the study included the 67% response rate for the entire state, with counties varying in response rate. Because of this, comparison of one county to another must be done with caution. The researcher's goal was to look at geographic patterns and clusters of counties in regard to nutrition risk potential, all within the context of other known features of the counties, such as whether the counties were metropolitan or non-metropolitan.

In addition, the surveys were completed by the older meal participants, with assistance from others if necessary. The survey was relatively simple, but relied on the respondent to accurately read and understand the questions. The DETERMINE Checklist has 10 questions that reflect behaviors or conditions associated with *potential* risk of poor nutrition status. More in-depth nutrition screening would be required to describe nutrition status more accurately. The advantage of using the DETERMINE Checklist in this study was that the checklist is used extensively throughout the United States, and health community agencies and nutrition professionals are familiar with the use and interpretation of the data. In addition, because the DETERMINE Checklist is a simple tool, intentionally developed using large print, and worded for ease of understanding by older persons, the collection of the data from a large number of individuals was possible, even with limited resources.

One time-consuming element of the project was the initial data entry into the database. This task consumed approximately a year, which lessened the timeliness of the information that was released.

Practical application of the GIS analysis in this study has included the ability to (1) strategically locate needed services for community-dwelling older Americans, who represent a composite of several ethnic groups and other groups that may have special and unique needs; (2) improve health and well being; (3) determine the need for education or other intervention; and (4) influence policy makers and decision makers who make decisions related to older Americans and their families.

Because of the extensive dissemination of its results, the project had a direct impact on services provided to older persons. For example: Programs for older people were expanded in the cooperative extension program in northeast Indiana. An additional assistant was hired to provide education and develop programs for older people. A steering committee in east central Indiana sought various types of data, including data from this project, to use in establishing guidelines and policies for future needs of senior meal programs; this steering group created, among other things, a partnership with a food bank and an innovative program to help older people in a rural remote community obtain nutritious meals at a local restaurant rather than a congregate meal site.

The data collection instrument itself provided a form of nutrition education and heightened awareness of factors that can lead to nutrition risk problems. The project also increased the visibility of older people's nutrition needs—evidenced by television, radio, and newspaper coverage—and heightened awareness by professionals of older people's nutrition needs.

Future plans for this application include further analysis of the data, using GIS, with an emphasis on examining the needs of older African-Americans in Indiana. Other goals are to automate data gathering of the DETERMINE screening tool through NAPIS and to readily utilize new census data as they become available.

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